Prioninæ, by F. C. Craighead. In the *Journ. Agric. Research* (vol. iv., No. 3) W. S. Pierce describes weevils of the genus Diaprepes, which injure sugar-cane in the West Indies, and gives details as to their variation and life-history.

The gipsy moth (*Porthetria dispar*) imported from France into Massachusetts in 1869 continues to occupy the attention of American entomologists; Mr. A. F. Burgess describes the means adopted in the New England States for checking its ravages (Bull. U.S. Dept. Agric., 204). His account is illustrated by an interesting set of maps showing the present range of the species in New England, and also of some of its natural enemies which have been imported from Europe, of which the large ground-beetle, *Calosoma sycophanta*, is the most formidable. Reference is also made to the strange "wilt-disease" which at times fortunately becomes epidemic among the caterpillars. It has been made the subject of a special research by Mr. R. W. Glaser (*Journ. Agric. Research*, vol. iv., No. 2). He finds that the disease was not present in North America before 1900, and believes that its spread may be at least partly due to some of the introduced parasites. The causative micro-organism has not been demonstrated.

The cabbage-fly (*Phorbia* or *Chortophila brassicae*) is one of our commonest and most destructive garden pests. Mr. J. T. Wadsworth has published (*Journ. Econ. Biol.*, vol. x., No. 1) a valuable and interesting account of a rove-beetle, *Aleochara bilineata*, the larva of which eats its way into the puparium of the cabbage-fly, and feeds on the pupa. Like some other beetle life-histories, this shows a tendency to hypermetamorphosis, the newly-hatched Aleochara being of the campodeiform type normal to the family, while the later instars, in accordance with their parasitic habit, have shortened legs and swollen bodies, approaching the cruciform type.

A contribution to our knowledge of the physiology of aquatic insects is due to Mr. S. K. Sen, who gives some observations on the respiration of Culicidæ (*Indian Journ. Med. Research*, vol. ii., No. 3). The larva of *Culex microannulatus* consumes 1·1 cubic mm. of oxygen per hour, the pupa 1·9 cubic mm., and the imago 2·5 c.c.; the increased oxygen-hunger of the pupa as compared with the larva is noteworthy, and it was found that the pupa is more quickly affected and killed by the want of oxygen. Systematic study of blood-sucking Diptera goes steadily on; the British species of Simulium are diagnosed by Mr. F. W. Edwards in the last number of the *Bulletin of Entom. Research* (vol. vi., part 1). This same number contains a report by Dr. W. A. Lamborn on the "control" of tsetse-flies (Glossina) in Nyasaland; a number of flies were caught by bird-lime spread on boards carried about by native boys, and digging-wasps are found to seize tsetses and carry them off. Hymenopterous parasites of the Chalcidoid group have been reared from Glossina puparia in northern Rhodesia, and these are described with excellent figures by Rev. Jas. Waterston, in the same number of the bulletin.

Of slight importance from the economic point of view, the Odonata (dragonflies) are yet of great general interest to the student of insects. Mr. E. B. Williamson has just published (Proc. U.S. Nat. Mus., vol. xlviii., pp. 601–38) some exceptionally valuable notes on Neo-tropical species belonging to the "demoiselle" (Agrionine) subfamily. The purely systematic entomological paper is usually a weariness to any not a specialist who may attempt to read it, but this author enlivens his accounts of structural details of diagnostic value with descriptions of the habits and adaptations of the beautiful insects which he loves to observe when alive in the swamps and forests of Central America and the Antilles.

G. H. C.

THE NATURAL HISTORY OF CORUNDUM.[1]

IN the Summary report of the Geological Survey of Canada for 1896 Mr. W. F. Ferrier directed attention to the occurrence of corundum crystals in the township of Carlow, Hastings County, Ontario, and to the probable economic importance of the discovery. This announcement led to the opening up of what has become the largest corundum mining industry in the world. In 1910 an important memoir by Adams and Barlow on the general geology of the district in which the corundum-deposits occur was published by the Geological Survey (Geology of the Haliburton and Bancroft Areas, Memoir No. 6), but the details as to these deposits were reserved for fuller treatment than was possible at that time. They are now given in the present volume, together with a general account of the occurrences of the mineral in other parts of the world.

Apart altogether from their economic importance, the Canadian deposits are of considerable scientific interest as throwing light on one of the methods by which corundum has been naturally produced. They are usually associated with nepheline and other alkaline syenites which occur at the junction of the great Laurentian granitic batholiths with the limestones of the Grenville series. Red alkaline syenites, rich in soda, together with their coarse-grained pegmatitic equivalents, are pre-eminently the corundum-bearing rocks throughout the district, although in one of the smaller areas the mineral occurs in anorthosites. The richest rock is known as corundum-pegmatite, dykes of which may attain a width of 18 ft. and contain as much as 75 per cent. of corundum. Individual crystals weighing 30 lbs. have been obtained from this rock. In other rocks they are smaller in size, and often sink to microscopic dimensions. The colour usually varies from blue to white. No transparent varieties suitable for use as gems have as yet been found.

In his classic researches carried out in Warsaw during the years 1891–96 and published in *Tschermak's Mineralogische und petrographische Mittheilungen* for 1898, Morozewicz proved that felspathic magmas, especially those rich in soda, possessed the power of dissolving alumina, and that on cooling the excess of alumina over that required to form felspar crystallised out as corundum. The facts described in this memoir clearly prove that the Canadian corundum has crystallised out of a highly felspathic magma in accordance with the principles experimentally established by Morozewicz. The mineral is extracted from the rocks by blasting, hand-picking, crushing, and dressing by methods akin to those frequently used by miners. From material fed to the mills containing 10½ per cent. of corundum a high-grade product consisting of from 90 to 95 per cent. is obtained. It is at present employed solely as an abrasive agent, although researches have been, and are still being, carried out to discover other uses. The value of the total amount placed on the market to the end of 1913 is about 2,000,000 dollars, and there has been no appreciable falling off in the amount produced during recent years. Its principal rivals are carborundum and artificial corundum, known as alundum, both of which are produced at Niagara Falls.

ANCIENT ARABIC METEOROLOGY.[2]

AT what stage of intellectual development, premonitory signs of weather were first connected with coincident, but probably unrelated, phenomena,

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[1] "Corundum: Its Occurrence, Distribution, Exploitation and Uses." By Alfred Ernest Barlow, Department of Mines, Canada. Pp. 377+28 plates and a geological map of Central Ontario.

[2] "Some Arabic Weather Sayings." By Mohammad Bey Kasim. Reprinted from the *Cairo Scientific Journal*, Nos. 97 and 98. (Alexandria, 1914.)

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and expressed in popular phrases is doubtful, but in every part of the world may be found a stock of proverbs that express the general experience. Egypt, of course, is no exception to the rule, and, owing to its old civilisation, it is probable that in these wise saws we have the fruits of the earliest meteorological observations. We cordially welcome, therefore, the paper by Mohammad Bey Kasim, who by industriously collecting a long list of these predictions, and translating them into English, has benefited both meteorology and folklore.

In a climate where the changes are frequent and apparently lawless, these are apt to be assigned to frivolous and irrational causes, but in more settled climates, as that of the Nile Valley, the prognostications may be regarded as founded on a more scientific basis. Weather changes are seasonal, rather than daily, and as the Coptic year is based on solar reckoning, the repetition of the same phenomena at nearly the same dates in successive years would tend to confirm the accuracy of the proverb, and give rise to a running commentary on the calendar, useful in the guidance of husbandry and agricultural operations.

Thus in the month Abib (July 8–August 6) we have in its translated form the saying:

In Abib, it will be found
We hear the running water's sound.

referring to the expected rise of the Nile, and, in the following month, Misra:

Misra makes all the watercourses flow,
Though difficulties it must undergo.

That the proverb-mongers were quite aware of the necessity of making provision for the variability of seasons, and not limiting the changes too rigidly to the arbitrary divisions of months, is shown by an ingenious interlocking of Amshir and Baramhat, which together include the spring from February 8–April 8, when periods of warm and cool weather will interchange:

The month of Amshir to Baramhat says:
Exchange ten of mine for ten of your days.

The author does, however, give a complete calendar, in which apparently an attempt is made to foretell the weather from day to day, but it is not clear whether this is a perpetual calendar, or liable to revision from year to year according to the fancy of the local expert. For comparison additional information founded on average meteorological data is supplied. The main climatological factors are sufficiently well indicated. Thus for 22 Tut (October 2) the comment is, "No hope of more rises of the Nile." The Cairo observations show that that date is the mean, and not the extreme of maximum flood, for which the variation is ±16 days. The fixing of the low stage of the Nile to 27–28 Bashans (May 4–5) is not so happy. The mean date from 1873 has been about a month later, but since the Aswan Reservoir has been utilised a comparison of dates may be misleading. The fact that is emphasised by this calendar is the advantage due to employing the apparent motions of the sun, as shown by the assistance given to the old meteorologists in the maintenance of a continuous record.

Another feature of this admirable compilation is the successful attempt to classify the terms used in Egypt to describe the degrees of variation in the climatological elements. The Egyptian vocabulary seems to be wide and rich; seven terms are given expressing gradations of "cold," and a round dozen for different degrees of heat. Naturally there must be a good deal of overlapping, and the phrase, "the hot weather (el harr) lasts seven days or three," may be capable of very wide interpretation. Apparently the author has been very successful in accommodating the terms expressing varying strength of winds to our Beaufort scale, and the accuracy in the two cases is no doubt comparable, since each depends on eye observation and memory. The forms of clouds, too, have long been described with sufficient accuracy, and Luke Howard, who has supplied our nomenclature, has but followed an unknown, but ancient, classification. We are glad to know that Mohammad Bey proposes to continue his investigations into a subject that cannot but grow more interesting the further it is pursued.

COMPETITIONS IN CONNECTION WITH THE UTILISATION AND DENATURING OF SPIRIT OR ALCOHOL FOR INDUSTRIAL PURPOSES.

THE following particulars have been received by the Board of Trade, through the Foreign Office, from the Russian Ambassador in London, respecting the international competitions organised by the Russian Ministry of Finance in respect (1) of methods of utilising spirit or alcohol or their products, and (2) of new substances for denaturing spirit or alcohol for industrial purposes.

As regards the first-mentioned competition, prizes of 60,000, 30,000, and 10,000 roubles, respectively, will be awarded for the invention of a novel means of adapting alcohol for the preparation of such a product as shall by its nature absolutely differ from the spirit from which it is made, *e.g.* vinegar, ether, chloroform, etc. Three prizes, of 50,000, 20,000, and 5000 roubles, respectively, will be awarded for the invention of a novel method of utilising spirit for the preparation of a product (*e.g.* a pharmaceutical or perfumery preparation) of which spirit or its products (sulphuric ether, etc.) will appear as one of its component parts or dissolvent, providing that spirit cannot be extracted profitably from the product. Three prizes of 30,000, 15,000, and 5000 roubles, respectively, will be awarded for the invention of a novel method of utilising spirit in productions, where spirit or its products would serve as temporary intermediary dissolvents of either of the extracted or precipitated materials, *e.g.* in the manufacture of smokeless powder, artificial silk, etc. Further prizes ranging from 75,000 to 5000 roubles will be awarded for the invention or perfection of apparatus for the utilisation of spirit as motive power, fuel, or illuminant.

The competition of new substances for denaturing spirit or alcohol is being organised with the object of extending the use of spirit for technical purposes, and accordingly three prizes of 30,000, 15,000, and 5000 roubles, respectively, are offered for finding novel denaturing materials for improving the existing methods of denaturing, which, whilst guaranteeing the free use of denatured spirit, would obviate any possibility of using it as a beverage.

Applications in respect of both these competitions should be addressed to "L'Administration générale des Impôts indirects et du Monopole de l'Alcool," Tutchkoff Naberezhnaia, Petrograd, not later than January 11–14, 1916, and must be accompanied by samples. Such applications should be made in the Russian or French languages, and be enclosed in a special envelope bearing an inscription or device of some sort, the name and address of the applicant being submitted under separate cover bearing the same inscription or mark.

Inventors may reserve the right of benefiting by their inventions and of protecting themselves with letters patent.

Copies of the full text of the conditions for participating in the two competitions above referred to may be obtained by United Kingdom firms interested, on application to the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C.

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